

Work Order ID 83087

April-12-12 4:11:58 PM

83087

Page 1

Item ID: D212-664-201

Accept

N900040100

Setup

Start

NS1

Revision ID:

Item Name: Crosstube Aft

Stop

NS2

Start Date: 12/04/2012 Start Qty: 1.00

1

Cust Item ID:

Required Date: 26/04/2012 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals: Process Plan: *MLJ*Date: *12/04/13* Tooling:

Date:

Run

Start

NR1

QC:

Date:

SPC (Y/N):

Date:

Stop

NR2

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
Draw Nbr	Revision Nbr								
D212-664-241	Rev D (DEO)								
DSI9563	<i>A B Jm</i>								
100		0.00							
100	DOCUMENT CONTROL								
DC									
Document Control									

SCRAP

Memo: Photocopy bluefile and create labels as per PPP D212-664-201 CHG005

110

110

Packaging

Pick Kit

0.00

Packaging

Memo

0.00

Packaging

MD 12-6-26

W/O: 83087

WORK ORDER CHANGES

DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: D212-664-201 PAR #: _____ Fault Category: X-tube NCR: Yes No DQA: Not Date: 12/08/13
 Resolution: _____ Disposition: Scrap QA: N/C Closed: NO Date: 12/08/14

		WORK ORDER NON-CONFORMANCE (NCR)				\$2916.11		
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			
12/08/13	120	Bent too high & narrow. R.C. BEND Process	MM 12/06/28 PSI 042	SCRAP. Beyond what can be accepted. PP 12/06/13	NO 12-6-28	CF 12-6-28	<u>MM</u> 12/06/28 PSI 042	<u>S</u> 12/06/28

NOTE: Date & initial all entries

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NS1

Revision ID:

Item Name: Crosstube Aft

Stop

NS2Start Date: 12/04/2012 Start Qty: 1.00 ***1***

Cust Item ID:

Required Date: 26/04/2012 Req'd Qty: 1.00 ***1***

Customer:

Reference:

Approvals:	Process Plan:	Date:	Tooling:	Date:	Run	Start	*NR1*
	QC:	Date:	SPC (Y/N):	Date:	Stop		*NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
120 *120* CNC Bend 2	BENDING MACHINE - CROSSTUBES	0.00							
CNC Alpha 160 Bender	Memo Bend tube as per Dwg D212-664-241 using CNC bender program 212-aft	0.00							
130 *130* QC Quality Control	QC15- Crosstube Dimensional Check	0.00							
	Memo	0.00							

W/O:		WORK ORDER CHANGES							
DATE	STEP	PROCEDURE CHANGE			By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
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Customer:

Reference:

Approvals: Process Plan: _____

Date: _____

Tooling: _____

Date: _____

Run Start

NR1

QC: _____

Date: _____

SPC (Y/N): _____

Date: _____

Stop

NR2Sequence ID/
Work Center ID

140

140

Crosstubes

Operation
Description

Crosstubes

Set Up/
Run Hours

0.00

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

Crosstubes

Memo

0.00

1-Drill pilot holes in tube as per Dwg D212-664-241 using drill Jig DT8550, DT8551, drill table DT8577 and locate tower holes #8 as per QSI0010.

2-Ream hole to finish size in tube as per Dwg D212-664-241 using drill Jig DT8550 & DT8551. Check dimensions between holes, both sides on both cuffs, to ensure alignment with saddle holes.

3-Scribe part # and batch # using vibrating stylus as per Dwg D212-664-241

4-Deburr & Inspect for surface damage. Repair damage within limits as per Dwg D212-664-241

150

Crosstubes Chemical Conversion

0.00

150

HandFXtube

Hand Finishing Crosstubes

Memo

0.00

Chemical Conversion Coat as within 24 hours of bending and drilling

W/O:		WORK ORDER CHANGES							
DATE	STEP	PROCEDURE CHANGE			By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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Date:

Tooling:

Date:

Run

Start

NR1

QC:

Date:

SPC (Y/N):

Date:

Stop

NR2Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

160

QC3- Inspect Part Finish

0.00

160

QC

Quality Control

170

QC5- Inspect part completeness to step on W/O

0.00

170

QC

Quality Control

180

Outsource process - NDT per QSI038 4.1

0.00

180

Outsource2

Outsource process - NDT

Memo

0.00

Liquid Penetrant Inspection as per QSI 038
Issue P/O: _____
LPI as per ASTM 1417 Level 2
Attach copy of NDT results to work order

W/O:		WORK ORDER CHANGES							
DATE	STEP	PROCEDURE CHANGE			By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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Cust Item ID:

Required Date: 26/04/2012 Req'd Qty: 1.00 ***1***

Customer:

Reference:

Approvals:	Process Plan:	Date:	Tooling:	Date:	Run	Start	*NR1*
	QC:	Date:	SPC (Y/N):	Date:	Stop		*NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
190 *1Q0* Packaging	Receive & Inspect for Damage & Mat'l Certs Packaging	0.00							
	Memo	0.00							
	Ensure copy of NDT results attached to work order.								

200	QC5- Inspect part completeness to step on W/O	0.00
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200 QC Quality Control	Memo	0.00
	Inspect for damage & ensure results are as per Dwg D212-664-241	

W/O:		WORK ORDER CHANGES							
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Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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Stop

NS2Start Date: 12/04/2012 Start Qty: 1.00 ***1***

Cust Item ID:

Required Date: 26/04/2012 Req'd Qty: 1.00 ***1***

Customer:

Reference:

Approvals:	Process Plan:	Date:	Tooling:	Date:	Run	Start	*NR1*
	QC:	Date:	SPC (Y/N):	Date:		Stop	*NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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210 Spray Painting per QSI005 4.2

0.00

210

SprayPaint

Memo 0.00

Spray Painting

1-Prime inside and outside crosstube as per QSI 005 4.2

2-Paint outside crosstube as per DEO D212-667-241 with White Imron as per
QSI 005 4.2PRIME:
Start Time: _____
Finish Time: _____PAINT:
Start Time: _____
Finish Time: _____

220

QC14- Inspect Spray Paint 0.00

220

QC

Quality Control

Memo 0.00

Then, Wrap in plastic bag to protect from scratches

W/O:		WORK ORDER CHANGES							
DATE	STEP	PROCEDURE CHANGE			By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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Work Order ID 83087

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Item ID: D212-664-201

Accept

83087

Revision ID:

Item Name: Crosstube Aft

Start Date: 12/04/2012 Start Qty: 1.00 ***1***Required Date: 26/04/2012 Req'd Qty: 1.00 ***1******N900040100***

Setup

Start

NS1

Stop

NS2**Reference:**

Approvals:	Process Plan:	Date:	Tooling:	Date:	Run	Start	*NR1*
	QC:	Date:	SPC (Y/N):	Date:	Stop		*NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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230

230

Crosstubes

Crosstubes

0.00

Crosstubes

Memo

0.00

1-Abrade mating surfaces of support and crosstube with 400 grit sandpaper,
clean the area with 4105S wash 'n' wipe2-Install supports with Proseal 890 per DSI9563 and QSI 015
A/R Proseal 890 Batch: _____

3-Install clamps as per Dwg D212-664-241. Torque clamps to 80-100 in lb.

240

240

QC

Quality Control

QC5- Inspect part completeness to step on W/O 0.00

Memo

0.00

250

250

Packaging

Pick Kit

0.00

Packaging

Memo

0.00

W/O:		WORK ORDER CHANGES							
DATE	STEP	PROCEDURE CHANGE			By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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Accept

N900040100

Setup

Start

NS1

Revision ID:

Item Name: Crosstube Aft

Stop

NS2Start Date: 12/04/2012 Start Qty: 1.00 ***1***

Cust Item ID:

Required Date: 26/04/2012 Req'd Qty: 1.00 ***1***

Customer:

Reference:

Approvals: Process Plan:

Date:

Tooling:

Date:

Run

Start

NR1

QC:

Date:

SPC (Y/N):

Date:

Stop

NR2Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
Number

Insp.

Stamp

260

QC4- 100% Inspect kits for completeness

0.00

260

QC

Quality Control

270

Packaging

0.00

270

Packaging

Memo

0.00

Packaging

Identify and pack for shipping as per PPP D212-664-201

280

QC21- Final Inspection - Work Order Release

0.00

280

QC

Quality Control

0.00

120810

W/O:		WORK ORDER CHANGES							
DATE	STEP	PROCEDURE CHANGE			By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
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NOTE: Date & initial all entries

Picklist Print

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Page 1

Work Order ID: 83087

Parent Item: D212-664-201

Parent Item Name: Crosstube Aft

83087
D212-664-201

Start Date: 12/04/2012

Required Date: 26/04/2012

Start Qty: 1.00

Required Qty: 1.00

Comments:

IPP Rev:E04.02.16ReformatK/DS
IPP Rev:F 06-03-29 Remove Coments on Pick List JLM
IPP Rev:G 07-04-30 As per Rev C JLM
IPP Rev:H 08-05-22 up date Qty of rubber cushion DD verified by:EC

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
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D212-664-
201TRNRevC

D212-664-201TRNRevC

Crosstube Turning Detail

D3595-063-530

D3595-063-530

RUBBER CUSHION

D212-664- 201TRNRevC	Manufactured	No	110	Each	0.0000	1	1	MO	12-6-26
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83095

**

D3595-063-530	Manufactured	No	230	Each	111.0000	2	2		
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**

Location

Location	Loc Qty	Loc Code
LG	72	
79932	72	
MAT052	39	
63407	6	
67185	6	
70067	18	
72745	2	
75783	7	

D2940-1

D2940-1	Manufactured	No	230	Each	19.0000	2	2	
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**

D2940-1

Support

Location

Location	Loc Qty	Loc Code
LG052	19	
79118	19	

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
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Picklist Print

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Page 2

Work Order ID: 83087

Parent Item: D212-664-201

Parent Item Name: Crosstube Aft

83087
D212-664-201

Start Date: 12/04/2012

Required Date: 26/04/2012

Start Qty: 1.00

Required Qty: 1.00

MS21920-28

Purchased

No

230

Each

79.0000

4

4

**

MS21920-28

Clamp(per MIL-DTL-8783C)

<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>
FG	5	
105884	5	
LG050	74	
116839	2	
118713	4	
120054	2	
120884	16	
121067	50	

D3428-1

Manufactured

No

250

Each

31.0000

1

**

D3428-1

Placard

<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>
ST042	31	
78933	14	
81881	17	

MS21042L6

Purchased

No

250

Each

790.0000

6

6

**

MS21042L6

Nut

<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>
ST300	790	
117677	25	
118384	3	
118927	48	
119075	514	
120308	200	

AN960JD616

NAS1149D0663J Purchased

No

250

Each

0.0000

18

18

**

AN960JD616

Washer

April-12-12 4:12:01 PM

Shop Packet Print

Page 2

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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Parent Item: D212-664-201

Parent Item Name: Crosstube Aft

83087
D212-664-201

Start Date: 12/04/2012

Required Date: 26/04/2012

Start Qty: 1.00

Required Qty: 1.00

AN6-40A

Purchased

No

250

Each

97.0000

4

4

AN6-40A

Bolt

<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>
ST342	97	
120187	68	
120833	4	
121349	25	

AN6-41A

Purchased

No

250

Each

59.0000

2

2

AN6-41A

Bolt

<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>
ST342	59	
119749	8	
120187	1	
120423	50	

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

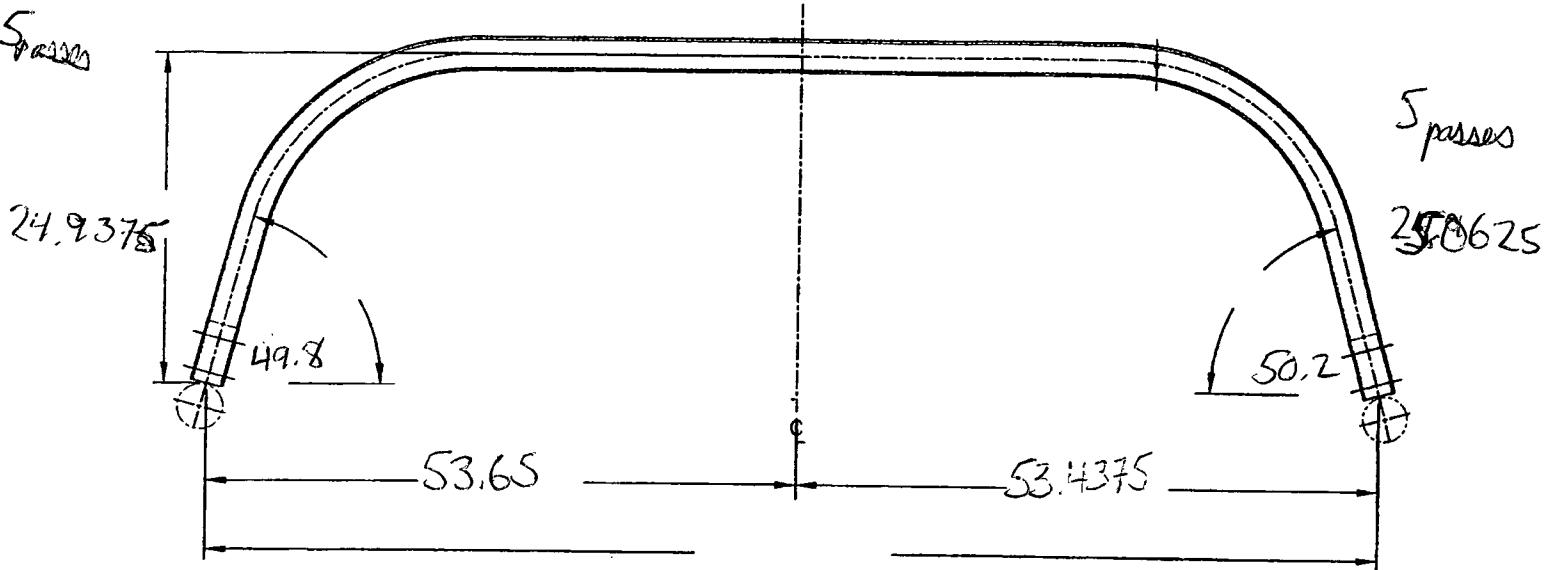
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DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

DART AEROSPACE LTD	Work Order:	83087
Description: Crosstube High Aft (205/212)	Part Number:	D212-664-201
Inspection Dwg: D212-664-241	Rev: D	Page 1 of 1

Required Dimension	Min	Max
Height	24.17	24.43
1/2 Span	53.59	53.85
Angle	49	52
Total Span	107.18	107.70

5 middle passes



Comments

QC15 Inspection	
Date	

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	
B	07.05.08	Dimensions updated per Dwg rev. C	KJ/JLM	
C	10.04.01	Dwg Rev updated	KJ	<i>[Signature]</i>

W/O:		WORK ORDER CHANGES					
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			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

D

Item	Qty -241	Qty -241B	Part Number	Description
1	X		D212-664-241	CROSSTUBE ASSEMBLY (205/212 HIGH AFT)
2		X	D212-664-241B	CROSSTUBE ASSEMBLY (214 HIGH AFT)
3	1	1	D6006-129	CROSSTUBE
4	2	2	D2940-1	SUPPORT
5	4	4	D3595-063-530	RUBBER CUSHION
6	4	4	MS21920-28	CLAMP (OR MS21920-30)
7	A/R	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)

GENERAL NOTES:

- 1) MATERIAL. MANUFACTURED FROM D6006-129
FINISHED LENGTH = 124 362±0.020
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
- 6) IDENTIFICATION: SCRIBE DART PART NUMBER "D212-664-XXX" AND BATCH NUMBER ON INSIDE OF CUFF
USING VIBRATING STYLUS.
- 7) WEIGHT: D212-664-241 = 44.2 lbs (PER IIN-D212-664)
D212-664-241B = 44.2 lbs (PER IIN-D212-664)
- 8) PART IS SYMMETRIC ABOUT CENTERLINE.
- 9) RUN CUTTER OFF PART. BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 5 PASSES MAXIMUM TUBE FLATTENING DUE TO BENDING
IS 6% BASED ON O.D.
- 11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 12) INSTALL D2940-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE
OF D2940-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE PER QSI 015 LET CURE FOR 12 HOURS
AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 13) INSTALL MS21920-28 CLAMPS (OR -30) WITH D3595-063-530 RUBBER CUSHIONS TO SECURE THE D2940-1
SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE OF CROSSTUBE
SUPPORT.
- 14) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE
SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR
DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND
MARKS ARE UNACCEPTABLE.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT
HAS NOT BOTTOMED-OUT AFTER TORQUING

SHOP COPY
RETURN TO
ENGINEERING
UNCONTROLLED COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER

NO. 83087 MLJ 11.09.28
12/04/13 UNDER REVIEW

DEO ATTACHED

RELEASED
2009-10-29
MP

D	REFORMAT/REVISE GENERAL NOTES/PART LIST; REORGANIZED VIEWS AND REFORMATTED DRAWING TO CURRENT STANDARDS; ADD -241B (ZN D4-2, B4-2); REMOVED REF & ADD TOLERANCES (ZN D8-3 & C4-3, C6-3 & A8-3); RELOCATED FLAG #6 PER PAR 08-046 (ZN A5-3); MOVED TURNING DETAIL & UPDATED TOLERANCE TO SHEET 4	RF	09.09.30
---	---	----	----------

C	REMOVE -1009 ABRASION STRIP; ADD MAGNOBOND 6398, CUSHION, REVERSE CLAMPS	PH	07.03.08
---	---	----	----------

B	ADD HOLES FOR COMPATABILITY WITH BHT/AA SKIDTUBES	PH	05.02.04
---	--	----	----------

A	NEW ISSUE	PH	00.12.12
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REV.	DESCRIPTION	BY	DATE
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DESIGN	PH	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	RF		
CHECKED	99	DRAWING NO.	REV. D
MFG. APPR.	DS	D212-664-241	SHEET 1 OF 4
APPROVED	MP	TITLE	SCALE
DE APPR.	MP	CROSSTUBE ASSY (205/212 HI AFT)	NTS
DATE	09.09.30	COPYRIGHT © 2009 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL, AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY OTHER PURPOSE, OR DISCLOSED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

W/O:		WORK ORDER CHANGES							
DATE	STEP	PROCEDURE CHANGE			By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)							
DATE	STEP	Description of NC Section A	Corrective Action Section B				Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date				

NOTE: Date & initial all entries

8

7

6

5

4

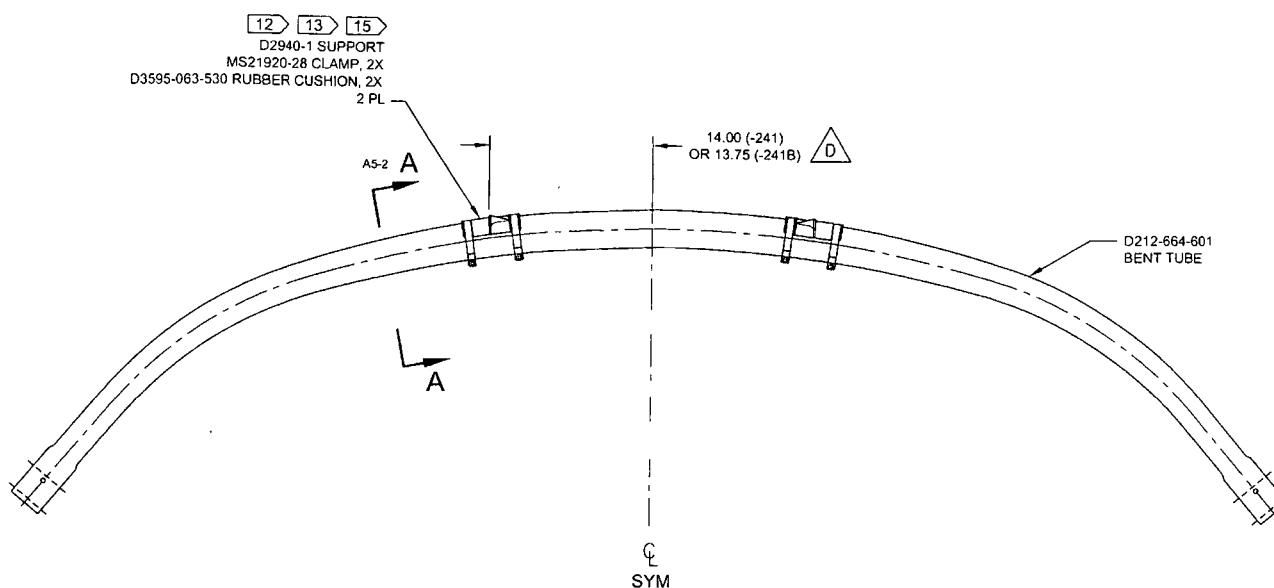
3

2

1

D

D



D212-664-241/241B
ASSEMBLY DETAIL

UNDER REVIEW
07/06/13

DEO ATTACHED

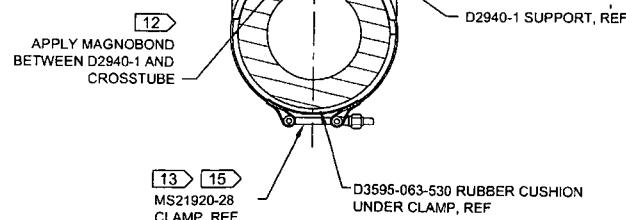
RELEASED
2009-10-29
MM

B

B

A

A



SECTION A-A D6-2
SCALE 4X

8 7 6 5 4 3 2 1

DESIGN	<i>MM</i>	DART AEROSPACE LTD
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA
CHECKED	<i>MM</i>	DRAWING NO.
MFG. APPR.	<i>MM</i>	D212-664-241
APPROVED	<i>MM</i>	REV. D
DE APPR.	<i>MM</i>	SHEET 2 OF 4
DATE	09.09.30	TITLE
		CROSSTUBE ASS'Y (205/212 HI AFT)
		NTS

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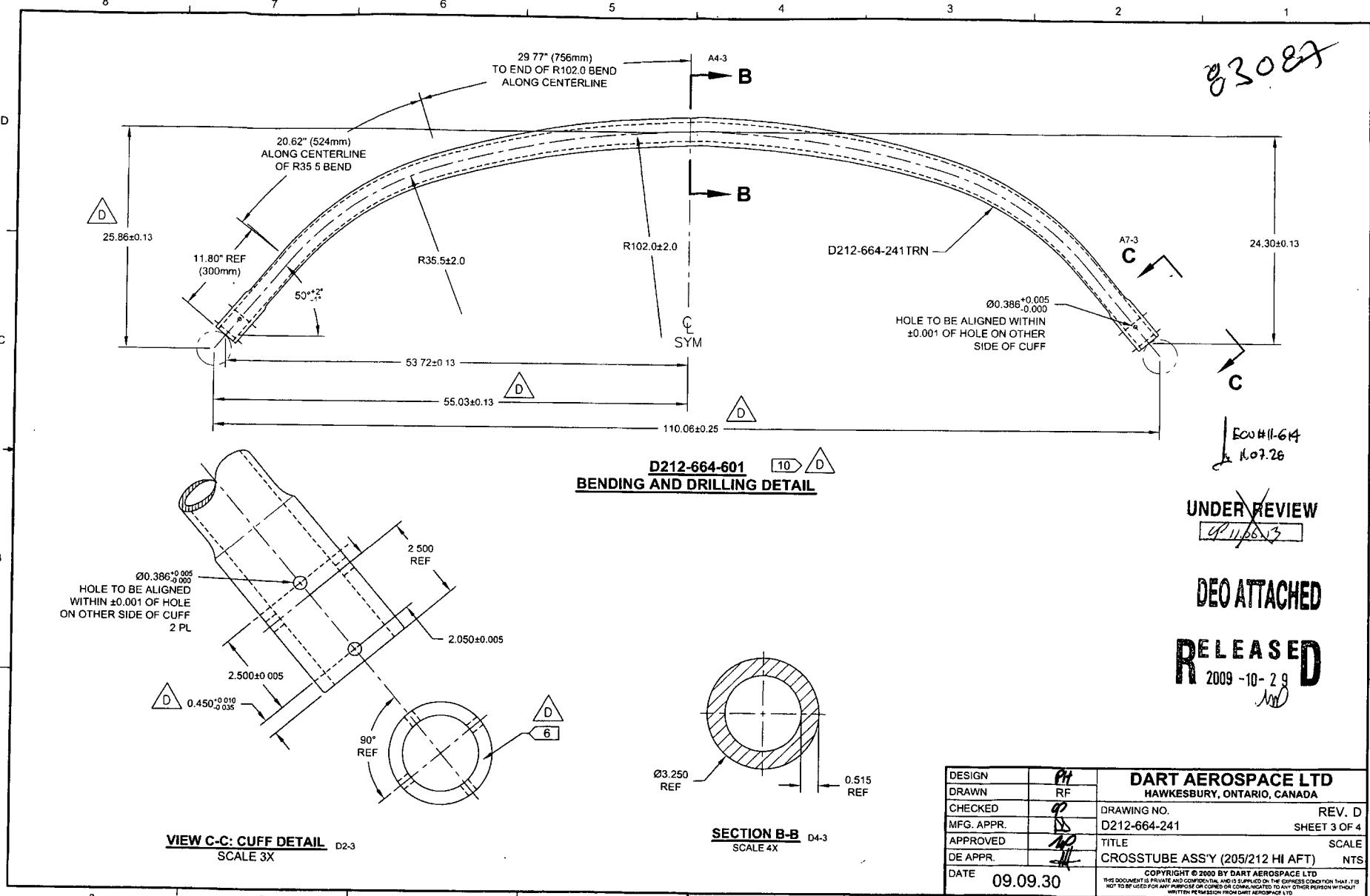
W/O:		WORK ORDER CHANGES							
DATE	STEP	PROCEDURE CHANGE			By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector	
			Initial Chief Eng	Action Description Chief Eng	Sign & Date				

NOTE: Date & initial all entries



DESIGN	RF	DART AEROSPACE LTD
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA
CHECKED	99	DRAWING NO.
MFG. APPR.	DA	D212-664-241
APPROVED	100	REV. D
DE APPR.	100	SHEET 3 OF 4
DATE	09.09.30	NTS

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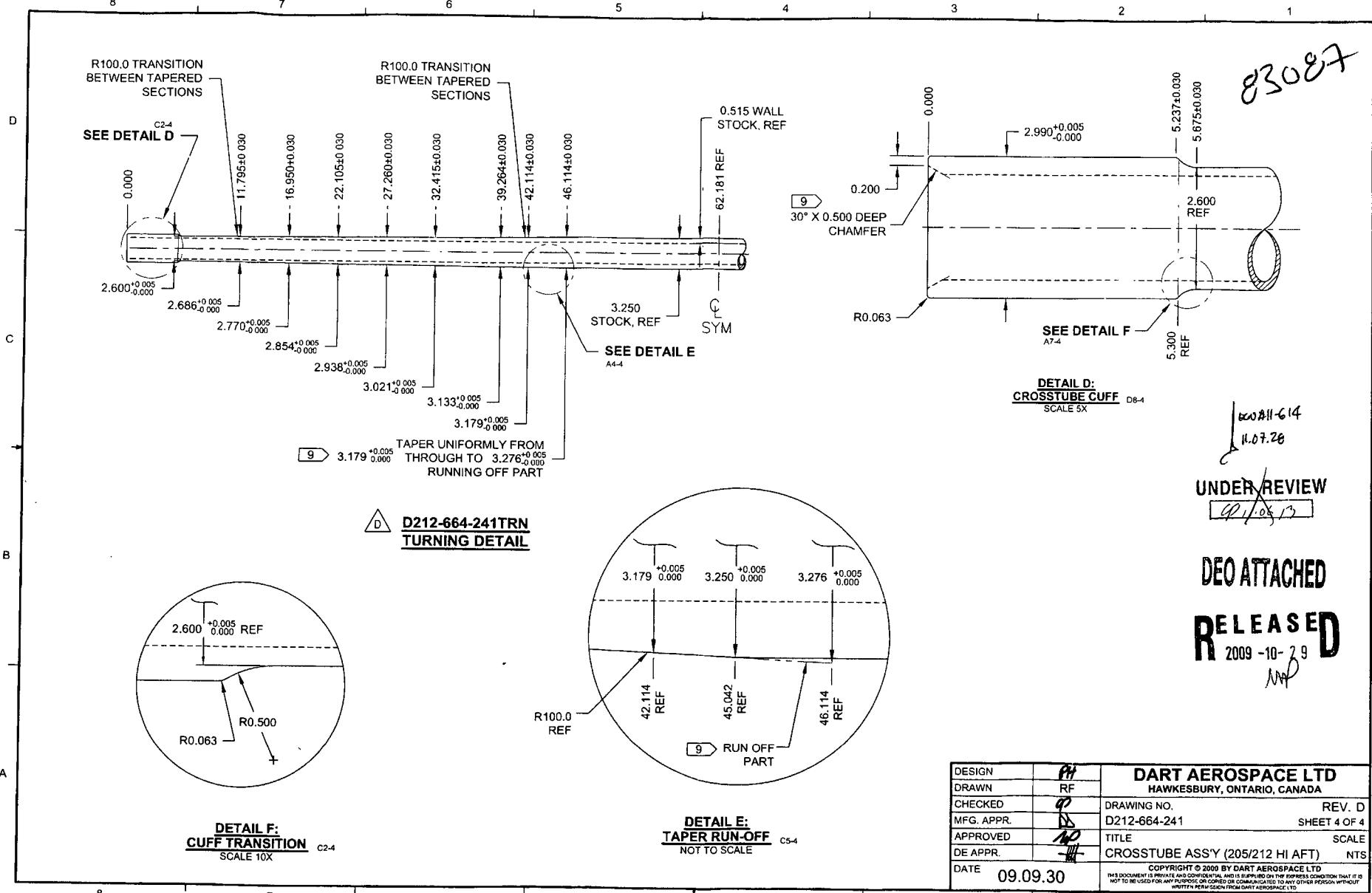
W/O:		WORK ORDER CHANGES							
DATE	STEP	PROCEDURE CHANGE			By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)							
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector	
			Initial Chief Eng	Action Description Chief Eng	Sign & Date				

NOTE: Date & initial all entries



DESIGN	PH	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	99	DRAWING NO.	REV. D
MFG. APPR.	DA	D212-664-241	SHEET 4 OF 4
APPROVED	100	TITLE	SCALE
DE APPR.	100	CROSSTUBE ASSY (205/212 HI AFT) NTS	
DATE	09.09.30	COPYRIGHT © 2000 DART AEROSPACE LTD	
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W/O:		WORK ORDER CHANGES							
DATE	STEP	PROCEDURE CHANGE			By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector	
			Initial Chief Eng	Action Description Chief Eng	Sign & Date				

NOTE: Date & initial all entries

83087

DRAWING NO. D212-664-241	TITLE CROSSTUBE ASSY (205/212 HI AFT)	REV. D	DART AEROSPACE LTD ENGINEERING ORDER	D.E.O. NO. D212-664-241-D-1	SHEET NO. SHEET 1 OF 2	SCALE NTS
DRAWN <i>b</i>	CHECKED <i>IP</i>	MFG. APPR. <i>IP</i>	APPROVED <i>MP</i>	DE APPR. <i>IP</i>		
DATE 11.04.07	DATE 11.04.11	DATE 11.04.12	DATE 11/04/12	DATE 11.04.12	DATE 11.04.12	

PURPOSE:

ADD AN INSPECTION WINDOW TO UNDERSIDE OF CROSSTUBE.

CHANGE:

NOTES 2 OF SHEET 1 IS AMENDED AS FOLLOWS:

IS:

2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
 PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
 MASK UNDERSIDE OF CROSSTUBE AS SHOWN (HATCHED AREA) AND
 PAINT OUTSIDE PER DART QSI 005 4.2
 REMOVE MASKING AND APPLY CLEAR COAT

RELEASED
2011-04-18
AM

UNDER REVIEW
 01.11.13
 BCN81-614
 11.07.28

WAS:

2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
 PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
 PAINT OUTSIDE PER DART QSI 005 4.2

W/O:		WORK ORDER CHANGES							
DATE	STEP	PROCEDURE CHANGE			By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

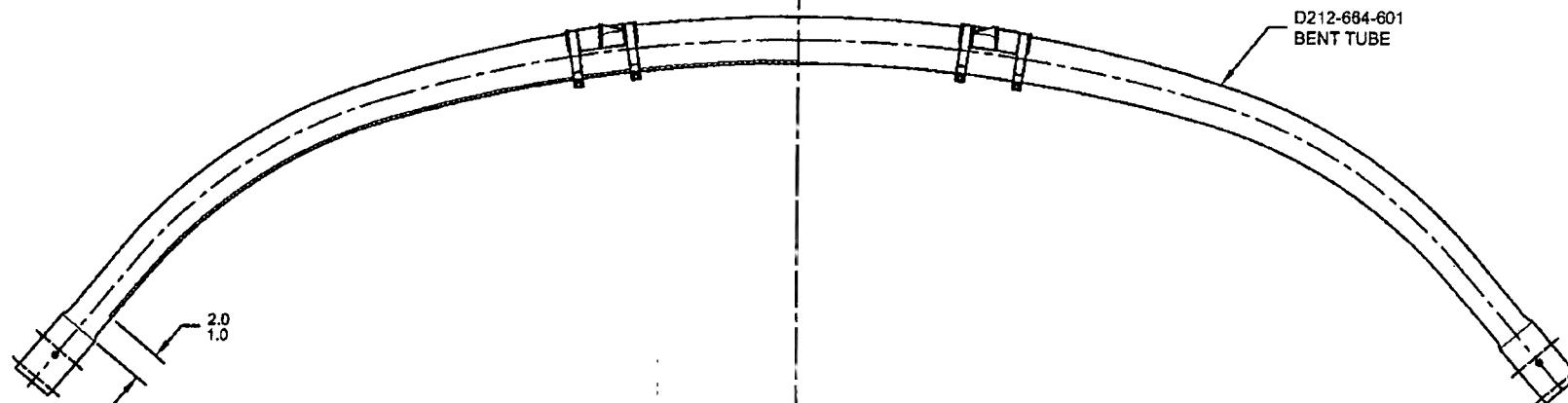
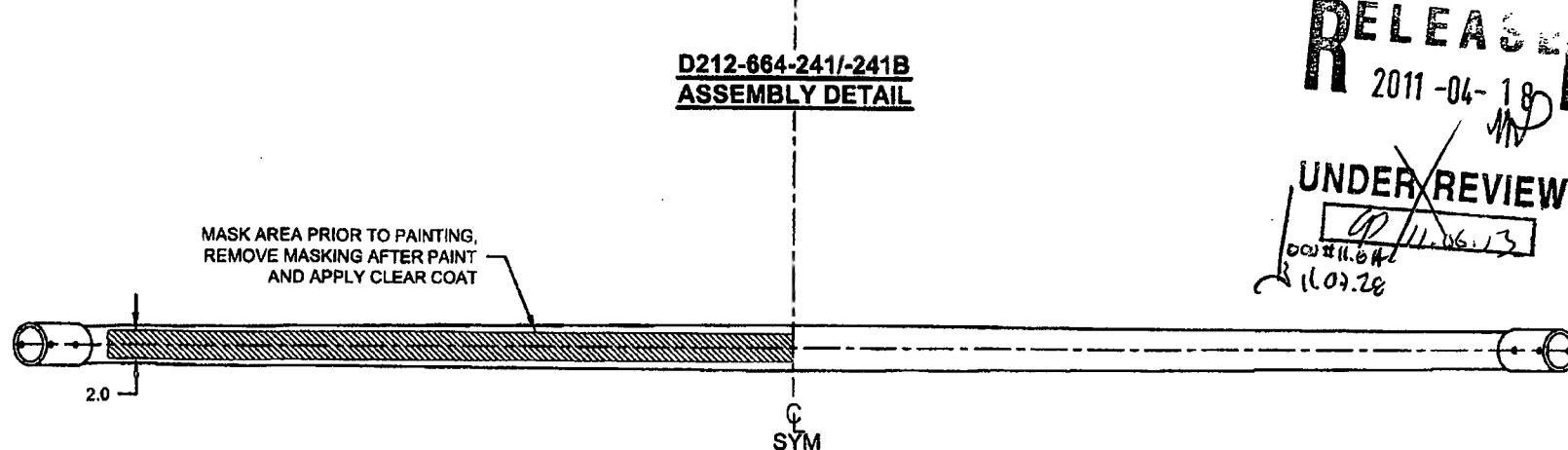
Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)							
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector	
			Initial Chief Eng	Action Description Chief Eng	Sign & Date				

NOTE: Date & initial all entries

03087

DRAWING NO. D212-664-241	TITLE CROSSTUBE ASSY (205/212 HI AFT)	REV. D	DART AEROSPACE LTD ENGINEERING ORDER	D.E.O. NO. D212-664-241-D-1	SHEET NO. SHEET 2 OF 2	SCALE NTS
DRAWN DATE 11.04.07	CHECKED DATE 11.04.11	MFG. APPR. <i>GP</i> DATE 11.04.12	APPROVED <i>MD</i> DATE 11.04.12	DE APPR. <i>MD</i> DATE 11.04.12		

IS:WAS:RELEASED
2011-04-18
*MD*UNDER REVIEW
GP 11.06.13
11.07.28

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

83087

DRAWING NO. D212-664-241	TITLE CROSSTUBE ASS'Y (205/212 HI AFT)	REV. D	DART AEROSPACE LTD ENGINEERING ORDER	D.E.O. NO. D212-664-241-D-2	SHEET NO. SHEET 1 OF 1	SCALE NTS
DRAWN <i>90</i>	CHECKED <i>ASS</i>	MFG. APPR. <i>AS</i>	APPROVED <i>MAP</i>	DE APPR. <i>MAP</i>		
DATE 11.07.15	DATE 11.07.20	DATE 11.07.21	DATE 11.07.21	DATE 11.07.21	DATE 11.07.21	

PURPOSE:

REPLACE MAGNOBOND WITH PROSEAL.

CHANGE:

IS:

Item	Qty -241	Qty -241B	Part Number	Description
7	A/R	A/R	PROSEAL 890 B-2	SEALANT, AMS-S-8802 CLASS B-2

WAS:

7	A/R	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)
---	-----	-----	----------------	---

NOTE 12 & 15, SHEET 1 IS AMENDED AS FOLLOWS:

IS:

- 12) TO INSTALL D2940-1 SUPPORT: ABRADE MATING SURFACE OF SUPPORT AND CROSSTUBE WITH 180-GRIT SANDPAPER AND REMOVE RESIDUE WITH MEK (OR EQUIVALENT). APPLY A 0.04" TO 0.07" THICK LAYER OF PROSEAL 890 CLASS B-2 (OR AMS-S-8802 CLASS B-2) SEALANT TO MATING SURFACE OF SUPPORT.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER PROSEAL 890 SEALANT HAS CURED FOR 72 HOURS.

WAS:

- 12) INSTALL D2940-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2940-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

RELEASED
2011-07-28
MAP

W/O:		WORK ORDER CHANGES							
DATE	STEP	PROCEDURE CHANGE			By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)							
DATE	STEP	Description of NC Section A	Corrective Action Section B				Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date				

NOTE: Date & initial all entries

DART SERVICE INSTRUCTION

TO AMEND INSTRUCTIONS FOR CONTINUOUS AIRWORTHINESS ICA-D212-664 Rev. 6 OR LATER
REF. CANADIAN STC: SH01-9
REF. FAA STC: SR01298NY
REF. EASA STC: EASA.IM.R.S.01304

PURPOSE:

The supports on the following crosstubes are now installed using Proseal instead of Magnobond:

D212-664-101/-101B @ CHG 005
D412-664-105 @ CHG 002
D212-664-107/-107B @ CHG 002

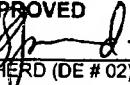
D212-664-201/-201B @ CHG 005
D212-664-207/-207B @ CHG 002

CHANGE:

For the crosstubes listed above, section 32.4 of ICA-D212-664 is amended as follows. Use Figure 1 of this service instruction and Figures 32-2 to 32-9 of ICA-D212-664 for further reference. For crosstubes of an earlier change number, it is recommended that if the supports are removed, the supports should be reinstalled using the procedure listed below.

32.4 SUPPORT INSTALLATION

- 32.4.1 Locate the area on the crosstube for installation of support (see Figure 1 of this service instruction). For D212-664-101/-107/-201/-207 and D412-664-105 crosstubes, the outward face of the support tabs should be 14.0" (355mm) from the crosstube center for 204/205/210/412/UH-1 aircraft. For installation on 214B/B-1 aircraft, the outward face of the support tabs should be 13.75" (349mm). Ensure paint finish of crosstube is intact; touch up as required per Chapter 5 (5.3.9) of ICA-D212-664.
- 32.4.2 If present, remove any paint/primer on bottom of supports. Abrade mating surfaces of support and crosstube with 400-grit sandpaper. Saturate a clean cloth with MEK or 4105S Wash'n'Wipe Degreaser or equivalent and wipe until there is no residue.
- 32.4.3 Ensure a layer of 3M Scotch-Weld 2216 B/A Epoxy Adhesive is on the bottom of the support. If required, either apply or touch-up support to have a 0.03" to 0.05" thick layer of adhesive over the entire mating surface. Allow supports to cure for 24 hours.
- 32.4.4 Abrade mating surfaces of support (after cure) and crosstube with 180-grit sandpaper. Saturate a clean cloth with MEK or 4105S Wash'n'Wipe Degreaser or equivalent and wipe until there is no residue.
- 32.4.5 Apply a 0.04" to 0.07" thick layer of Proseal 890 Class B or AMS-S-8802 Class B sealant underneath applicable support and install support as shown in Figure 1 of this service instruction.
- 32.4.6 Install the clamps opposite to crosstube support as shown in section A-A of Figure 1. Install rubber cushions underneath each clamp around the bottom circumference of the crosstube up to the crosstube centerline. Torque clamps 80-100 in-lb (9.0-11.3 Nm). It is acceptable to use smaller or larger sized MS21920-XX clamps than those listed in ICA-D212-664, ensure that after torquing the clamps per this instruction, the nuts are in safety but not bottomed out.
- 32.4.7 Prior to installing crosstube on aircraft, allow supports to cure for 72 hours and recheck torque on clamps.

CANADA	
DEPARTMENT OF TRANSPORT	
AIRCRAFT CERTIFICATION	
BRANCH	
DAO # 01-O-01	
APPROVED	
BY:	
D. SHEPHERD (DE # 02)	
DATE:	11.07.20
CERT. NO.:	SH01-9
ISSUE NO.:	3

B	ADD 3M 2216 ADHESIVE TO SUPPORT		CP	11.07.15
A	NEW ISSUE		CP	11.06.14
REV.	DESCRIPTION		BY	DATE
DESIGN	97	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	DRAWING NO. DSI 9563	REV. B SHEET 1 OF 2
DRAWN	97			
CHECKED	ASS			
MFG. APPR.	N/A			
APPROVED				
DE APPR.				
DATE	11.07.15	TITLE	SCALE	NTS
SUPPORT INSTALLATION CHANGE				
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43028

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

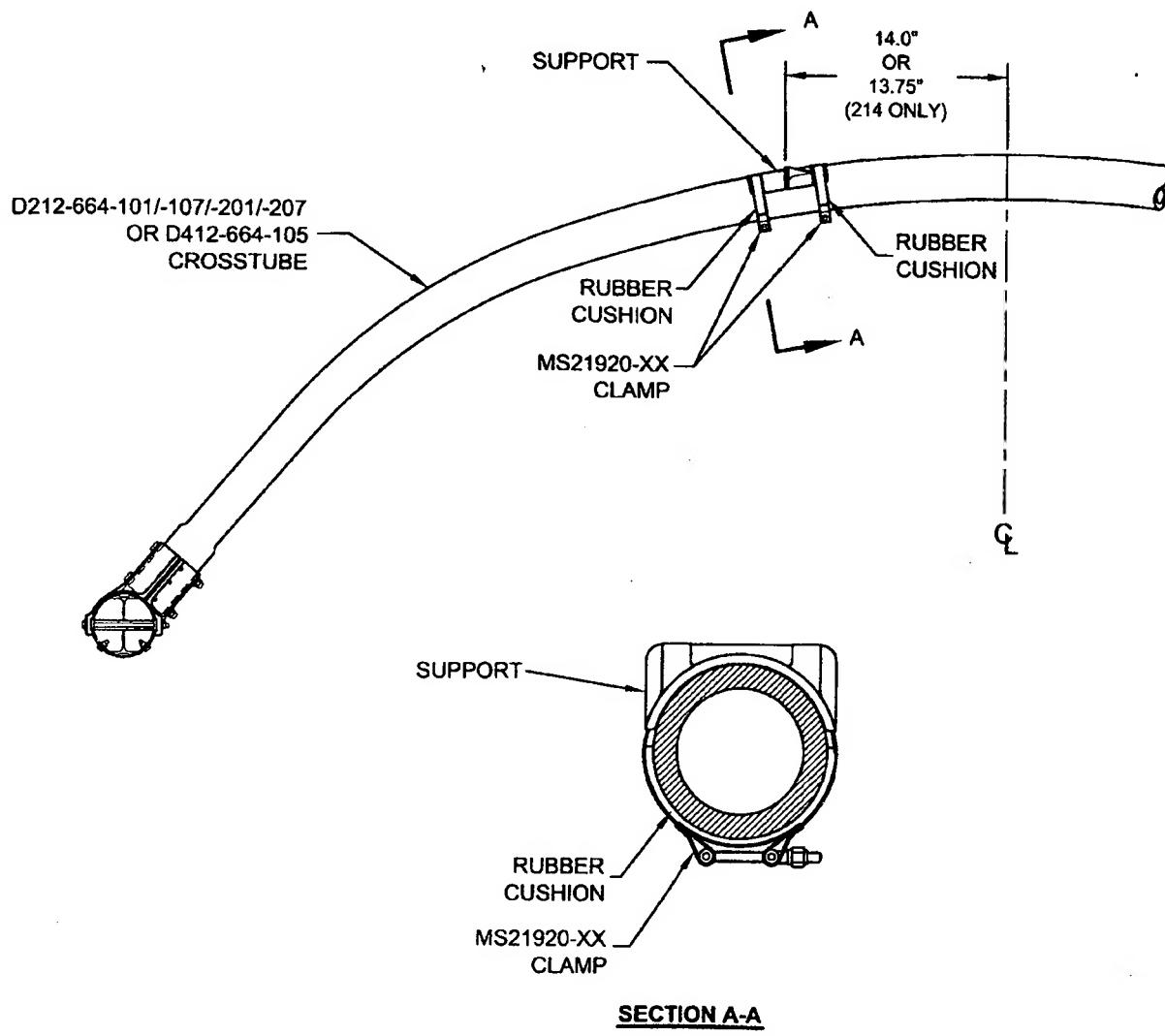


FIGURE 1: SUPPORT INSTALLATION

CANADA	
DEPARTMENT OF TRANSPORT	
AIRCRAFT CERTIFICATION	
BRANCH	
DAO # 01-O-01	
APPROVED	
BY:	<i>[Signature]</i>
D. SHEPHERD (DE # 02)	
DATE:	11.07.20
CERT. NO.:	SH01-9
ISSUE NO.:	3

DESIGN	<i>90</i>	DART AEROSPACE LTD	
DRAWN	<i>90</i>	HAWKESBURY, ONTARIO, CANADA	
CHECKED	<i>ADS</i>	DRAWING NO.	REV. B
MFG. APPR.	<i>N/A</i>	DSI 9563	SHEET 2 OF 2
APPROVED	<i>JAD</i>	TITLE	SCALE
DE APPR.	<i>TH</i>	SUPPORT INSTALLATION CHANGE NTS	
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EB0520

W/O:		WORK ORDER CHANGES							
DATE	STEP	PROCEDURE CHANGE			By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)							
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector	
			Initial Chief Eng	Action Description Chief Eng	Sign & Date				

NOTE: Date & initial all entries